

The seal of the State of South Dakota is a circular emblem. It features a central illustration of a landscape with a river, a windmill, and a small town. The words "STATE OF SOUTH DAKOTA" are written in a circular path around the top, and "GREAT PLAINS" around the bottom. The year "1889" is at the very bottom. A banner across the middle of the seal reads "UNDER THE GREAT PLAINS".

STATEMENT OF BASIS

Title V Air Quality Permit Renewal

**NuStar Pipe Line Operating Partnership, L.P.
Sioux Falls, South Dakota**

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1.0 BACKGROUND

The original Title V air quality permit was issued to Amoco Oil Company on May 5, 1997. The permit was for three gasoline storage tanks and one bottom loading petroleum and distillate loading rack. On December 30, 1998, the permit was transferred to Kaneb Pipe Line Operating Partnership, L.P. (Kaneb). On March 31, 2008, the Department of Environment and Natural Resources (Department) was notified by Kaneb that the company would be changing its name to NuStar Pipeline Operating Partnership, L.P. (NuStar). The name change was effective on March 31, 2008.

On May 13, 2008, the Department received NuStar's initial notification that its Sioux Falls facility is subject to 40 CFR Part 63, Subpart BBBB – National Emission Standards for Hazardous Air Pollutants for Source Category: Gasoline Distribution Bulk Terminals, Bulk Plants and Pipeline Facilities because it loads more than 250,000 gallons per day of petroleum products. The Department was notified at that time of Nustar's intent to install a vapor combustion unit to comply with Subpart BBBB.

NuStar submitted an application to modify its Title V air quality permit on November 23, 2009. In the application, Nustar notified the Department that they planned on installing a 2009 John Zink vapor combustion unit at the Sioux Falls terminal and planned on installing it that same month. The application was considered to be complete on May 12, 2010 and the permit was issued on September 7, 2010.

2.0 Operational Description

NuStar Pipeline Operating Partnership, L.P. (NuStar) operates a refined petroleum fuels distribution terminal in Sioux Falls. The terminal receives and stores diesel fuels, gasoline, and fuel additives through a pipeline network which is then loaded into tanker trucks for delivery to fuel stations and the like. The primary Standard Industrial Classification (SIC) Code is 4613.

2.1 Operational Equipment

Table 1-1 provides a description of the existing equipment at NuStar's facility in Sioux Falls from the Title V air quality operating permit #28.0703-01 issued April 9, 2007 and modified on September 7, 2010.

Table 1-1 – Description of Permitted Units, Operations, and Processes

Unit	Description	Maximum Capacity	Control Equipment
#1	Tank 45-1 - 1942 Graver aboveground storage tank for refined petroleum and ethanol products	1,874,796 gallons	Internal floating roof
#2	Tank 45-2 - 1942 Graver aboveground storage tank for refined petroleum and ethanol products	1,878,744 gallons	Internal floating roof
#3	Tank 45-3 - 1942 Graver aboveground storage tank for refined petroleum and ethanol products	1,878,744 gallons	Internal floating roof

Unit	Description	Maximum Capacity	Control Equipment
#4	Pre-1980, two bay, bottom fill, transport truck loading rack.	147,168,000 gallons per 12-month period ¹	2009 John Zink Vapor Control Unit Model # zct-5-8-35-x-2/8
#5	Tank 2-65 - 1942 Graver fixed roof above ground storage tank for refined petroleum and ethanol products	91,560 gallons	Not applicable
#6	2001, soil vapor extraction system – installed by Delta Environmental	15 tons per year of VOCs ¹	Not applicable

¹ – Based on permit throughput limit

2.2 Insignificant Activities

Table 1-2 identifies the units NuStar operates that qualify as insignificant activities under the Administrative Rules of South Dakota (ARSD) 74:36:05:04.01. The information was obtained from the statement of basis associated with the 2007 renewed permit.

Table 1-2 – Insignificant Activities

INSIGNIFICANT TANKS			
Tank ID	[gallons]	Tank Design	Liquid Type
25-9	1,037,400	Internal floating	Gasoline (RVP10)
18-1	772,800	Internal floating	Gasoline (RVP10)
54-1	2,263,800	Cone/fixed roof	#2 Fuel Oil
54-2	2,268,000	Cone/fixed roof	#2 Fuel Oil
4-1	168,000	Domed/External floating	Gasoline (RVP10)
4-2	168,000	Domed/External floating	Gasoline (RVP10)
42-1	1,751,400	Cone/fixed roof	#2 Fuel Oil
42-2	1,751,400	Cone/fixed roof	#2 Fuel Oil
10 tanks	> 1,000 per	Horizontal	Fuel additives
Water tank	270,000	Open roof	Storm water/tank wash
INSIGNIFICANT EQUIPMENT			
Description	Capacity	Units	Fuel Type
Kewanee boiler	0.71	MMBtu/hr heat input	Natural Gas
Air stripper	≈ 30	gallons per minute	Not applicable

2.3 Requested Action

On June 27, 2011, the Department received an application to renew NuStar's Title V air quality operating permit. NuStar has requested the following modifications to its permit:

1. Unit #4 – increase the annual gasoline throughput from 147,168,000 gallons per 12-month period to 220,000,000 gallons per 12-month period.

2. Unit #5 – This tank was placed into biodiesel service and VOC emissions are less than 2.0 tons per year. NuStar is requesting this unit be considered an insignificant activity;
3. Unit #6, the soil vapor extraction unit has been shut down as the result of the Department issuing a No Further Action closure for the site on April 19, 2009 – NuStar has requested that unit be removed; and
4. Tank 25-9. Currently listed as an insignificant unit, NuStar has stated that with the requested increase in gasoline throughput, the VOC emissions from this tank will exceed 2.0 tons per year and subject the tank to permitting.

The Department will review these proposed revisions and make the appropriate changes in the permit.

3.0 NEW SOURCE PERFORMANCE STANDARDS

The Department reviewed the new source performance standards (NSPS) and determined that the following may be applicable to this facility.

3.1 Standards Applicable to Storage Tanks

There are three New Source Performance Standards for storage vessels. The three standards are applicable to the following storage vessels:

1. 40 CFR Part 60, Subpart K: applicable to storage vessels for petroleum liquids capable of storing greater than 40,000 gallons and commenced construction after June 11, 1973 but prior to May 19, 1978;
2. 40 CFR Part 60, Subpart Ka: applicable to storage vessels for petroleum liquids capable of storing greater than 40,000 gallons and commenced construction after May 18, 1978; and
3. 40 CFR Part 60, Subpart Kb: applicable to storage vessels for volatile organic liquids capable of storing 75 cubic meters (approximately 19,813 gallons) or greater and commenced construction after July 23, 1984.

The four permitted storage tanks were constructed prior to applicability dates. Also, Tank 25-9, which was previously considered an insignificant activity but is now a permitted unit, was constructed prior to the applicability date. Therefore, NuStar is not subject to any of the three New Source Performance Standards.

3.2 ARSD 74:36:07:23 – 40 CFR Part 60, Subpart XX

The Department reviewed the Standards of Performance for Bulk Gasoline Terminals to determine if it is applicable to NuStar's operation. Subpart XX is applicable if:

1. The provisions of this subpart are applicable to the total of all the loading racks at a bulk gasoline terminal which deliver liquid product into gasoline tank trucks; and

2. The construction or modification of the loading rack commences after December 17, 1980.

NuStar's bulk truck loading terminal was originally constructed in 1942. In 1988, the loading rack was reconfigured from a top loading rack to a bottom loading rack. Switching from a top loading rack to a bottom loading rack did not increase emissions and did not exceed 50% of the replacement cost of a new loading rack. Therefore, the switch was not considered a modification or reconstruction and was not subject to this subpart. This information was obtained from the statement of basis associated with the permit issued in 2002.

3.3 Other Applicable New Source Performance Standards

The Department reviewed the other New Source Performance Standards and determined there are no other standards applicable to NuStar.

4.0 New Source Review

The Administrative Rules of South Dakota (ARSD) 74:36:10:01 notes that new source review regulations apply to areas of the state which are designated as nonattainment pursuant to the Clean Air Act for any pollutant regulated under the Clean Air Act. NuStar's operations are located near Sioux Falls, South Dakota, which is in attainment for all the pollutants regulated under the Clean Air Act. Therefore, NuStar is not subject to new source review.

5.0 Prevention of Significant Deterioration

A prevention of significant deterioration (PSD) review applies to new major stationary sources and major modifications to existing major stationary sources in areas designated as attainment under Section 107 of the Clean Air Act for any regulated air pollutant. The following is a list of regulated air pollutants under the PSD program:

1. Total suspended particulate (PM);
2. Particulate with a diameter less than or equal to 10 microns (PM10);
3. Particulate with a diameter less than or equal to 2.5 microns (PM2.5);
4. Sulfur dioxide (SO₂);
5. Nitrogen oxides (NO_x);
6. Carbon monoxide (CO);
7. Ozone – measured as volatile organic compounds (VOCs);
8. Lead;
9. Fluorides
10. Sulfuric acid mist;
11. Hydrogen sulfide;
12. Reduced sulfur compounds;
13. Total reduced sulfur; and
14. Greenhouse gases (carbon dioxide, methane, nitrous oxide, etc.).

If the source is considered one of the 28 named PSD source categories listed in Section 169 of the federal Clean Air Act, the major source threshold is 100 tons per year of any regulated air pollutant, except for greenhouse gases. The major source threshold for all other sources is 250 tons per year of any regulated pollutant, except for greenhouse gases.

One of the 28 source categories listed is “petroleum storage and transfer units with a total storage capacity exceeding 300,000 barrels.” Under the PSD program, petroleum refers to unrefined crude oils. The facility stores only refined petroleum fuels, and less than 300,000 barrels; therefore, the PSD threshold for this facility is 250 tons per year.

NuStar’s Sioux Falls facility was constructed in 1942 prior to the promulgation of the PSD program and was not required to obtain a PSD permit (grandfathered). However, any modification that occurs at this facility must be reviewed to determine if it is considered a major modification and subject to a PSD review.

According to the Clean Air Act, once a pollutant is regulated under any part of the Act, (as was the case with greenhouse gas emissions after the motor vehicle regulations were finalized in March 2010) major new sources or major modifications are subject to the PSD program and Title V air quality operating permit program. Under the Clean Air Act, PSD and Title V air quality operating permits are required for all sources that emit a regulated air pollutant above 100 or 250 tons per year, depending on the source. This threshold, if applied to greenhouse gases, would greatly increase the number of facilities requiring a PSD review or Title V air quality operating permit. Based on administrative necessity, EPA increased these thresholds through the “Tailoring Rule.”

On May 13, 2010, EPA issued the final version of the “Tailoring Rule” for greenhouse gas emissions. The major source threshold for greenhouse gases is listed below:

1. New PSD source because of a criteria air pollutant, the major source threshold for greenhouse gases is 75,000 tons per year of carbon dioxide equivalent or more;
2. New PSD source if greenhouse gas emissions are 100,000 tons per year of carbon dioxide equivalent or more;
3. For an existing PSD source because of a criteria air pollutant, a major modification for greenhouse gases is an increase of 75,000 tons per year of carbon dioxide equivalent or more;
4. For an existing non-PSD source that has the potential to emit 100,000 tons per year of carbon dioxide equivalent emissions or more, a major modification for greenhouse gases is an increase of 75,000 tons per year of carbon dioxide equivalent or more; and
5. In addition to subsection (2) and (4), a specific greenhouse gas, without calculating the carbon dioxide equivalent, also needs to emit greater than 100 or 250 tons per year, whichever is applicable, to be regulated.

5.1 Emission Factors

The Department uses stack test results to determine air emissions whenever stack test data is available from the source or a similar source. When stack test results are not available, the Department relies on manufacturing data, material balance, EPA’s Compilation of Air Pollutant Emission Factors (AP-42, Fifth Edition, Volume 1) document, the applicant’s application, or other methods to determine potential air emissions.

Potential uncontrolled emissions for each applicable pollutant are calculated from the maximum design capacity listed in the application and assuming the unit operates every hour of every day of the year. Potential uncontrolled emissions are not realistic of the actual emissions and are used only to identify which air quality permit and the requirements NuStar must meet.

Potential uncontrolled emissions do not include any pollution control equipment; however, the loading rack does have a John Zink Vapor combustor device. Potential controlled VOC emissions are calculated assuming that the vapor combustor unit is in operation.

5.2 Potential Emissions from Loading Rack

Loading rack emissions occur primarily as a result of the loading of transport tanks with gasoline. The dry tanks contain vapor from the previous load. As the tank fills, these vapors are displaced and vented to the vapor collection unit. Because of the low volatility of distillate oils, negligible amounts of vapor remain in transport tanks previously filled with these products.

Volatile organic compound emissions from the loading rack are estimated based upon the gasoline throughput and a loading loss emission factor calculated using Equation 5-1, which is derived from AP-42, 5.2-4, June 2008.

Equation 5-1 – Loading Loss

$$L_L = 12.46 \frac{SPM}{T}$$

Where:

- L_L = loading loss, in pounds per 1,000 gallons of liquid loaded;
- S = saturation factor;
- P = true vapor pressure of liquid loaded, in pounds per square inch absolute;
- M = molecular weight of vapors, in pounds per pound-mole; and
- T = temperature of liquid loaded, in Rankin degrees.

Throughput data for the loading rack was provided in the 2011 renewal application. The maximum NuStar is capable of processing through the loading rack is limited by the throughput limit of 60,000 barrels per day or 220,000,000 gallons per year which NuStar accepted to avoid the requirements in 40 CFR Part 63, Subpart R. Because NuStar can process 100% of the throughput limit as gasoline which results in the greatest volatile organic compound emissions, the potential to emit from the loading rack will be based on gasoline only. The parameters for Equation 4-1 for distillate oil and denatured ethanol are listed for informational purposes. This data is summarized in Table 5-1 and used in Equation 5-1 to calculate emissions.

Table 5-1 – Potential Uncontrolled Loading Rack Emissions

	Gasoline	Distillate	Denatured Ethanol
Modeled Throughput (gallons per year)	220,000,000		
S = saturation factor	0.6	0.6	0.6
P = true vapor pressure (pounds per square inch)	4.023	0.0076	0.4893
M = molecular weight (pounds per pound mole)	62	130	51.26

T = Temperature (Rankin)	504.8	504.8	504.8
L _L = loading loss (pounds per 1000 gallons)	3.71	0.015	0.37
VOC emissions (tons per year)	408		

5.3 Potential Emissions from Loading Rack with Vapor Combustion Unit

The loading rack is equipped with a 1999 John Zink volatile organic combustion unit rated at 52 million Btus per hour and fired with natural gas. Volatile organic compound emissions from the loading rack are piped to the combustor unit.

Subpart BBBBBB requires that a loading rack with a gasoline throughput of greater than 250,000 gallons per day must meet a VOC emission limit of less than 80 milligrams per liter (mg/l) of gasoline loaded into gasoline cargo tanks at the loading rack. NuStar conducted stack testing of the vapor combustion unit on December 16, 2009. The stack test indicated that the vapor combustion unit operated with a VOC emission rate of 11.74 mg/l (4.64 pounds per hour) while loading gasoline. The controlled VOC emissions are calculated using equation 5-2.

Equation 5-2 – Controlled Loading Loss

$$VOC \left(\frac{\text{ton}}{\text{yr}} \right) = 80 \left(\frac{\text{mg}}{\text{l}} \right) \div 453,592 \left(\frac{\text{mg}}{\text{lb}} \right) \times 3.785 \left(\frac{\text{l}}{\text{gal}} \right) \times 220,000,000 \left(\frac{\text{gal}}{\text{yr}} \right) \div 2,000 \left(\frac{\text{lb}}{\text{ton}} \right)$$

Although the vapor combustion unit reduces volatile organic compound and hazardous air pollutant emissions, the combustion process does emit other air pollutants. The emission rate for the air pollutants from the loading rack's vapor combustor, which burns natural gas, is based on AP-42, Table 1.4-2, 7/98, and is listed below: The Department assumed the sulfur content of natural gas to be 0.2 grains/100 cubic feet.

- PM/PM10/PM2.5 = 7.6 pounds per million cubic feet (0.008 pounds per million Btus);
- SO₂ = 0.6 pounds per million cubic feet (0.0006 pounds per million Btus);
- NO_x = 100 pounds per million cubic feet (0.098 pounds per million Btus);
- CO = 84 pounds per million cubic feet (0.08 pounds per million Btus);

The John Zink vapor combustion unit is rated at 52 million Btus per hour. The emissions (E) from the vapor combustion unit are calculated using Equation 5-3.

Equation 5-3 – Estimated Emissions from Vapor Combustion Unit

$$E \left(\frac{\text{ton}}{\text{year}} \right) = \text{Emission Rate} \left(\frac{\text{lbs}}{\text{MMBtu}} \right) \times 52 \left(\frac{\text{MMBtu}}{\text{hour}} \right) \times 8,760 \left(\frac{\text{hour}}{\text{year}} \right) \div 2,000 \left(\frac{\text{lbs}}{\text{ton}} \right)$$

The potential emissions from the vapor combustion unit for the other air pollutants are shown in Table 5-2.

Table 5-2 – Potential Loading Rack with Vapor Combustion Unit Emissions (tons per year)

TSP/PM10/PM2.5	SO ₂	NO _x	VOC	CO
1.8	0.1	22.3	73.4	18.2

The emission factors for greenhouse gases while firing natural gas are from AP-42, Tables 1.4-1 and 1.4-2, July 1998 and are listed below:

- Carbon Dioxide (CO₂) = 120,000 pounds per million cubic feet (117.6 pounds per million Btus);
- Nitrous oxide = 2.2 pounds per million cubic feet (0.002 pounds per million Btus);
- Methane = 2.3 pounds per million cubic feet (0.002 pounds per million Btus).

In the case of the greenhouse gases, the emission factors for carbon dioxide, nitrous oxide and methane need to be multiplied by 1, 310, and 21, respectively, to convert the results to carbon dioxide equivalent emissions.

The carbon dioxide equivalent emissions were calculated using Equation 5-3. The potential emissions for the greenhouse gases are summarized in Table 5-3.

Table 5-3 –Vapor Combustor Unit Greenhouse Gas Potential Emissions
Potential Greenhouse gas Emissions (tons per year)

Pollutant	Potential Emissions	Potential Carbon Dioxide Equivalent
Carbon Dioxide	26,785	26,785
Nitrous Oxide	0.5	155
Methane	0.5	10.5
Total		26,951 tons per year

5.4 Storage Tanks

The storage tank emissions were calculated by the applicant using the equations similar to the Environmental Protection Agency's Tanks 4.09 program and are included in the application. The tank emission results are summarized in Table 5-4.

Table 5-4 - Storage Tank VOC (tons per year)

Unit #	Tank #	VOCs
1	45-1	3.32
2	45-2	3.32
3	45-3	3.36
5	2-65	0.51
	4-1	0.85
	4-2	1.17
	18-1	1.98
	25-9	2.11
	42-1	0.72
	42-2	0.72
	54-1	0.82
	54-2	0.82
	2-1	0.003
	2-2	0.008

	Additive Tanks 3 - 10	0.07
Total		19.9

5.5 Potential Emission Summary

The potential uncontrolled emissions for the tanks and loading rack are summarized in Table 5-5.

Table 5-5 - Potential Uncontrolled Emissions (tons per year)

Equipment	TSP/PM10/PM2.5	SO₂	NO_x	VOC	CO	CO_{2e}
Loading Rack without combustion unit	-	-	-	408	-	-
Storage Tanks	-	-	-	19.9	-	-
Total	-	-	-	428	-	-

NuStar's potential emissions for regulated air pollutants are greater than the major source threshold for the PSD program; however, NuStar constructed this facility prior to the promulgation of the PSD program. Therefore, NuStar is grandfathered-in under the PSD program. However, any modification that occurs at this facility must be reviewed to determine if it is considered a major modification and subject to a PSD review.

Potential controlled emissions (assuming continuous operation of the vapor combustion unit controlling emissions from the loading rack) are shown in Table 5-6.

Table 5-6 Potential Controlled Emissions (tons per year)

Equipment	TSP/PM10/PM2.5	SO₂	NO_x	VOC	CO	CO_{2e}
Loading Rack with combustion unit	1.8	0.1	22.3	73.4	18.2	26,951
Storage Tanks	-	-	-	19.9	-	-
Total	2	0	22	93	18	26,951

NuStar's air quality permit will contain conditions requiring the operation of the vapor combustion unit whenever the loading rack is operated. NuStar will be considered a minor source.

6.0 National Emission Standards for Hazardous Air Pollutants

The Department reviewed 40 CFR Part 61 to determine the applicability to this facility to any of the subparts and determined there were no applicable subparts.

7.0 Maximum Achievable Control Technology Standards

The federal Maximum Control Technology Standards are applicable to both major and area sources of hazardous air pollutants. A major source of hazardous air pollutants is a facility that has the potential to emit greater than 10 tons of a single hazardous air pollutant or 25 tons of any combination of hazardous air pollutants. An area source is a source that is not a major source of hazardous air pollutants.

7.1 Potential HAP Emissions

The Department used the baseline values for gasoline vapor phase HAP-VOC weight percentages listed in Table 11.3-2 of the EPA's January 2001 document *Gasoline Marketing (Stage I and Stage II)*, which are displayed in Table 7-1.

Table 7-1: Gasoline Vapor Phase HAP-VOC Weight Percentages

HAP Component	Percentage of total VOC emissions
Benzene	0.9 %
Ethyl Benzene	0.1 %
Toluene	1.3 %
Xylene	0.5 %
2,2,4-Trimethylpentane	0.8 %
Hexane	1.6 %
Cumene	0.05 %
Total =	5.25 %

Based on the HAP-VOC percentages above, hexane will be the single hazardous air pollutant emitted in the greatest amount. Table 7-2 identifies the potential hazardous air pollutant emissions from the loading rack considering the vapor combustion unit. Again, gasoline will create the greatest amount of hazardous air pollutant emissions from the loading rack. In addition, NuStar is required to operate the vapor combustion unit at all times, therefore, the potential emissions from the loading rack will be based on using the vapor combustion unit.

Table 7-2 – Potential Loading Rack Emissions

	Gasoline
VOC emissions (tons per year)	408
HAP percentage	5.25%
Hexane percentage	1.6%
HAP total (tons per year)	21.4
Hexane Total (tons per year)	6.5

The storage tank emissions were calculated by the applicant using the Environmental Protection Agency's Tanks 4.09 program and are included in the application. The tank emission results are summarized in Table 6-3.

Table 7-3 Potential HAP Emissions from Storage Tanks (tons per year)

Unit #	Tank #	HAPs	Hexane
1	45-1	0.17	0.05
2	45-2	0.17	0.05
3	45-3	0.18	0.05
5	2-65	0.03	0.01
	4-1	0.04	0.01
	4-2	0.06	0.02
	18-1	0.10	0.03
	25-9	0.11	0.03
	42-1	0.04	0.01
	42-2	0.04	0.01
	54-1	0.04	0.01
	54-2	0.04	0.01
	2-1	0.00	0.00
	2-2	0.00	0.00
	Additive Tanks 3 - 10	0.00	0.00
	Total	1	0

The potential hazardous air pollutant emissions for the loading rack and storage tanks are summarized in Table 7-4.

Table 7-4: Potential Uncontrolled HAP Emissions

Source	Total HAPs	Hexane
Loading Rack	21.4 tons/year	6.5 tons/year
Storage Tanks	1.0 tons/year	0.3 tons/year
Total =	22 tons/year	7 tons/year

Table 7-4 demonstrates NuStar is considered an area source of hazardous air pollutants. The Department reviewed the Maximum Achievable Control Technology Standards under 40 CFR Part 63 and determined the following may be applicable to NuStar.

7.2 ARSD 74:36:08:12 - 40 CFR 63, Subpart R

The Department reviewed 40 CFR Part 63, Subpart R – National Emission Standards for Gasoline Distribution Facilities. In accordance with ARSD 74:36:08:12, as referenced to 40 CFR § 63.420(a), the affected source to which this subpart applies is each bulk gasoline terminal, except those bulk gasoline terminals that result in an E_T value less than 1 and the facility applies with 40 CFR § 63.420(c), (d), (e), and (f). E_T is based on Equation 7-1 and is derived from 40 CFR § 63.420(a)(1).

Equation 7-1 – Area Source Equation for Gasoline Distribution Facilities

$$E_T = CF[0.59(T_F)(1 - CE) + 0.17(T_E) + 0.08(T_{ES}) + 0.038(T_I) + 8.5 \times 10^{-6}(C) + KQ] + 0.04(OE)$$

Where:

- E_T = Emissions screening factor for bulk gasoline terminals;
- $CF = 0.161$ for bulk gasoline terminals that do not handle any reformulated or oxygenated gasoline containing 7.6 percent by volume or greater methyl tert-butyl ether or 1.0 if handling reformulated or oxygenated gasoline containing 7.6 percent by volume or greater methyl tert-butyl ether;
- T_F = Total number of fixed roof gasoline storage tanks without an internal floating roof;
- CE = Control efficiency of the vapor processing system on the storage vessels;
- T_E = Total number of external floating roof gasoline storage tanks with only primary seals;
- T_{ES} = Total number of external floating roof gasoline storage tanks with primary and secondary seals;
- T_I = Total number of fixed roof gasoline storage tanks with an internal floating roof;
- C = The number of pumps, valves, connectors, load arm valves, and open ended lines in gasoline service;
- $K = 4.52E-6$ for bulk gasoline terminals with uncontrolled loading racks (no vapor collection and processing system) or $4.5E10-9$ for bulk gasoline terminals with controlled loading racks (loading racks that have vapor collection and processing system installed on the emission stream);
- Q = Gasoline throughput limit, in liters per day; and
- OE = Total HAP from other emission sources not specified by the other parameters (miscellaneous sources).

NuStar requested changes in the application to the screening equation (Equation 7-1) for the following:

1. Change Q from 147,168,000 gallons per 12-month period to 220,000,000 gallons per 12-month period or 2,281,619 liters per day.

Table 7-5 displays the values for Equation 7-1.

Table 7-5 – Values for the Area Source Equation

Terminal	CF	T_F	CE	T_E	T_{ES}	T_I	C	K	Q	OE	E_T
Sioux Falls	0.161	5	0	0	0	5	4,000	4.52E-06	2,281,619	1.083	0.853

The total emissions, as calculated by the screening equation, for the gasoline distribution facility are less than 1.0. Using this determination, NuStar would be considered an area source and this MACT standard would not be applicable.

7.3 ARSD 74:36:08:106 – 40 CFR 63, Subpart BBBBBB

DENR reviewed 40 CFR 63 Subpart BBBBBB - National Emission Standards for Hazardous Air Pollutants for Source Category: Gasoline Distribution Bulk Terminals, Bulk Plants, and Pipeline Facilities. Subpart BBBBBB applies to each area source gasoline distribution bulk terminals, bulk plants, and pipeline facilities. NuStar's facility in Sioux Falls is considered a bulk gasoline terminal because its gasoline throughput is 20,000 gallons per day or greater. NuStar is subject to

the requirements of Subpart BBBBBB because it is a bulk gasoline terminal that is not subject to 40 CFR Part 63, Subpart R or CC.

Based on NuStar's gasoline throughput limit for Subpart R, NuStar's bulk gasoline terminal is capable of loading 250,000 gallons or more of gasoline per day. NuStar submitted its initial notification for Subpart BBBBBB on December 27, 2010, and indicated it was in compliance with the Subpart BBBBBB. On January 25, 2012, NuStar submitted a semiannual report and Notification of Compliance in one report. NuStar indicated it was in compliance with Subpart BBBBBB.

NuStar commenced construction of the Sioux Falls facility prior to November 9, 2006 and has not modified any of the operations that would be considered reconstruction as defined in 40 CFR § 63.2. Therefore, NuStar's Sioux Falls facility is considered an existing affected source and must comply with the standards in this subpart no later than January 10, 2011.

Several of the storage tanks (4-1, 4-2, 18-1, 25-9, 42-1, 42-2, 54-1, 54-2, 2-1, and 2-2) were considered insignificant activities because their potential emissions were less than 2 tons per year. However, these tanks may be applicable to this standard if they would store gasoline; therefore, these tanks will be included in the permit as permitted equipment.

7.4 Other MACT Standards

The Department reviewed the other Maximum Achievable Control Technology Standards and determined there are no other standards applicable to NuStar.

8.0 State Requirements

8.1 State Particulate Emission Limits

ARSD 74:36:06:02(1) and 74:36:06:03(1), establish state emission limits for total suspended particulate matter. In addition, ARSD 74:36:12:01 establishes a visible emission limit of 20 percent opacity for each unit. The vapor combustion unit associated with Unit #1 is the only unit that emits particulate emissions.

In accordance with ARSD 74:36:06:02(1)(a), a fuel burning unit with heat input value less than 10 million Btus per hour may not exceed 0.6 pounds of particulate emissions per million Btu of heat input. Based on the heat input capacity of the vapor combustion unit, it is not applicable to this total suspended particulate matter emission limit.

In accordance with ARSD 74:36:06:02(1)(b), a fuel burning unit with a heat input equal to or greater than 10 million Btus per hour heat input may not exceed the particulate emissions rate determined by Equation 7-1.

Equation 7-1 – Particulate Emissions Limit for Fuel Burning Units =

$$E_{TSP} = 0.811 \times H^{-0.131}$$

Where:

- E_{TSP} = emission rate, in pounds per million Btu heat input, and

- H = heat input, in million Btus per hour.

The heat input “H” for the vapor combustor is listed at 52 million Btus per hour. Therefore, the total suspended particulate emission limit is 0.5 pounds per million Btus. Based on burning natural gas, the particulate matter emission rate is 0.008 pounds per million Btus which demonstrates compliance with the state’s particulate limit.

8.2 State Sulfur Dioxide Emission Limits

In accordance with ARSD 74:36:06:02(2) and ARSD 74:36:06:03(2), the permitted units may not emit sulfur dioxide emissions to the ambient air in an amount greater than three pounds of sulfur dioxide per million Btus of heat input. The sulfur dioxide emission limit is applicable to Unit #1.

Unit #4 is fired with natural gas. The sulfur dioxide emission rate for propane is 0.0006 pounds per million Btus. Therefore, NuStar is capable of meeting the sulfur dioxide emission limit.

8.3 Performance Tests

On December 6, 2009, a stack performance test was conducted on the vapor combustion unit to demonstrate compliance with the requirements in 40 CFR Part 63 Subpart BBBBBB. The test resulted in a volatile organic compound emission rate of 4.64 pounds per hour while loading approximately 287,156 gallons of product of which 253,295 gallons was gasoline (88%). The volatile organic compound emission rate for gasoline was 11.74 milligrams per liter which is in compliance with the limit of less than 80 milligrams per liter established in 40 CFR Part 63 Subpart BBBBBB. The tested emission rate is less than 50% of the performance standard. The department will not require a new emission test as part of a permit condition. However, the permit allows the department to require a test if deemed necessary.

8.4 Compliance Assurance Monitoring

Compliance assurance monitoring is applicable to permit applications received on or after April 20, 1998, from major sources applying for a Title V air quality operating permit. NuStar’s application was received after April 20, 1998. Therefore, compliance assurance monitoring is applicable to any unit that meets the following criteria:

1. The unit is subject to an emission limit or standard for the applicable regulated air pollutant;
2. The unit uses a control device to achieve compliance with any such emission limit or standard; and
3. The unit has potential uncontrolled emissions of the applicable regulated air pollutant that are equal to or greater than 100 percent of the amount, in tons per year, required for a source to be classified as a major source.

The only unit that meets all three criteria is the loading rack. The loading rack is required to meet New Source Performance Standards under 40 CFR Part 63 Subpart BBBBBB. In accordance with 40 CFR § 64.2(b)(1)(i), if the applicable standard was proposed by EPA after November 15, 1990 pursuant to section 111 or 112 of the Act, the unit is exempt from

compliance assurance monitoring. This MACT Standard was promulgated after November 15, 1990. Therefore, compliance assurance monitoring is not applicable because the monitoring, recordkeeping and reporting requirements are sufficient in the MACT Standard to ensure compliance.

8.5 Periodic Monitoring

Periodic monitoring is required for each emission unit that is subject to an applicable requirement at a source subject to Title V of the federal Clean Air Act. NuStar is required to meet particulate, sulfur dioxide, and opacity emission limits. Opacity from the storage tanks and loading rack are negligible. The vapor combustor burns propane and the particulate, sulfur dioxide, and opacity emissions are negligible and based on past experience, do not warrant periodic monitoring. Periodic monitoring for the vapor combustor and tanks shall consist of the recordkeeping and reporting requirements in the Maximum Achievable Control Technology Standards that are applicable to NuStar.

9.0 RECOMMENDATION

Based on the above findings, NuStar is classified as a major source under the Title V air quality operating permit program. A major source is one that has the potential to emit over 100 tons per year of a regulated air pollutant. NuStar will be required to operate within the requirements stipulated in the following regulations:

- ARSD 74:36:05 – Operating Permits for Part 70 Sources;
- ARSD 74:36:06 – Regulated Air Pollutant Emissions;
- ARSD 74:36:08 – Maximum Achievable Control Technology Standards;
- ARSD 74:36:11 – Performance Testing;
- ARSD 74:36:12 – Control of Visible Emissions;
- ARSD 74:36:13 – Continuous Emission Monitoring Systems; and
- ARSD 74:37:01 – Air Emission Fees.

Based on information the Department received in the permit application, NuStar's Title V air quality operating permit may be renewed. Any questions on this review should be directed to Keith Gestring, Engineer II, with the Department of Environment and Natural Resources.